

## WEATHER IN THE UNITED STATES

## THE WEATHER ELEMENTS

By P. C. DAY

## GENERAL CONDITIONS

March, like the preceding months of 1928, was mainly without the tempestuous character ordinarily associated with the weather of the first part of the year over the more northern districts, and for the country as a whole it was unusually favorable for the outdoor operations common to the season.

## PRESSURE AND WINDS

While changes from warm to cool and from cyclonic to anticyclonic conditions were fairly frequent they were usually not of extensive proportions and the month lacked much of the rough weather usually associated with the period attending the end of winter and the beginning of spring.

The first cyclone giving important precipitation over an extensive area formed over the Southwest about the 7th. By the following morning it had moved to the middle Missouri Valley with light precipitation over a small area near the center, but by the morning of the 9th the center had moved to northern Ohio, and the precipitation area had overspread a large part of the country from the Great Plains eastward, some heavy snows occurring in the upper Lake region and local heavy rains in the southern Appalachian region. During the following day the precipitation area extended to the Atlantic coast with some heavy local rains over the Middle Atlantic States. At the same time an extensive precipitation area had overspread the far Northwest continuing for several days, the rainfall being heavy at times near the coast, with occasional snows in the adjacent mountains.

On the 15th a second cyclone having its origin in the far Southwest had moved to the lower Rio Grande Valley and precipitation, mostly snow, had fallen in the Rocky Mountain region from western Montana southward and had extended into the southern Plains. During the following 24 hours the center moved to northern Alabama and the precipitation area advanced eastward to the Atlantic coast with a secondary depression of the barometer extending southward into the Gulf of Mexico. Heavy rains had fallen in the west Gulf States and nearby areas with local snows in the lower Ohio Valley. By the morning of the 17th the secondary cyclone had advanced into northern Florida displacing the primary storm and during the following two or three days it moved slowly northward along the coast, increasing in severity and attended by local sleet and some heavy snows over districts removed from the coast, finally reaching northern New England and the Canadian Maritime Provinces by the morning of the 19th.

The first half of the third decade was mainly without important precipitation from the Rocky Mountains eastward, but by the 26th cyclonic conditions became established in the central valleys and precipitation had occurred in numerous sections from the Mississippi Valley eastward with local snows in the upper Lake region. During the following day the precipitation area extended rather generally into the more eastern districts, though little rain or snow occurred over the districts from Maryland and eastern Virginia to central and southern New England.

Closely following the cyclone last mentioned, another formed over the middle Rocky Mountain area and by the morning of the 28th it was central over Kansas. During the following 24 hours it moved to Arkansas, but without precipitation of consequence save light snows over a narrow area from Colorado and Nebraska to southern Lake Michigan. By 8 a. m. of the 30th this storm had developed materially and was central over western Pennsylvania, attended by local heavy rain in the Ohio Valley and to the southward, and by snow, sleet, or glaze in the lower Missouri Valley and thence eastward to southern Michigan and northern Ohio, the glaze becoming heavy and destructive over the northern parts of Indiana and Ohio and near-by portions of adjacent States, causing much damage to overhead wires, trees, shrubs, etc. This storm continued its course toward New England and the Canadian Maritime Provinces during the 31st, but with diminishing intensity.

Over the far Western States there was rather frequent precipitation during the first half of the month. There was generally little from the 15th to 20th, but during the last decade showers were frequent, particularly near the middle of the decade when wide areas had important rains in the lower elevations and considerable snow on the high mountains.

Anticyclones were mainly unimportant and brought no decided weather changes save on the 5th and 6th when a high-pressure area moving from the Canadian Northwest to the Great Lakes and Atlantic coast caused sharp falls in temperature up to 40° or more over these areas. Also about the 14th a "high" moved into the Dakotas and then advanced to the eastward and southward bringing the lowest temperatures of the month over extensive areas in the Southwest and eastward over the Gulf States during the following few days. An anticyclone that first appeared of small importance when over the upper Missouri Valley on the 26th caused an unusually wide and extensive fall in temperature within the following 24 hours from central Texas northeast to the Great Lakes, though, on account of the generally higher temperatures prevailing prior thereto it did not bring the lowest temperatures of the month.

The paths pursued by cyclones and anticyclones are presented in Charts II and III, respectively.

The average atmospheric pressure for the month is shown on Chart VI, while the departures from normal and changes from the values of the month preceding appear as insets to Charts II and III.

The prevailing wind directions also are shown on Chart VI and the notes concerning wind, hail, and other severe weather disturbances appear at the end of this section.

## TEMPERATURE

Like the preceding months of the year, March was mainly warm with no important periods of outstanding variations from the means and extremes of other years. As in January and to a considerable extent in February the temperatures were decidedly high over the western two-thirds of the country and comparatively near normal in the eastern third.

The first week was mainly cooler than normal over the districts east of the Mississippi River, and moderately warmer in the districts to the westward. No important cold entered the more southern districts though the lowest temperatures of the month occurred over many of the northern and interior districts, readings of 20° to

30° or more below zero occurring at exposed points in the Rocky Mountain region, the upper Lakes, and Wyoming. northern New England, the lowest, -37°, occurring in

The second week was warmer than normal over all parts save the more northeastern States, and along the northern border from North Dakota eastward to the upper Lakes. This period was decidedly warm, plus 8° to 12°, from the middle Mississippi Valley northwestward to the Canadian boundary. The week ending March 20 averaged moderately cool over most central and eastern districts and continued mild in the far West, portions of Montana and North Dakota having averages from 5° to nearly 10° warmer than normal.

The week ending the 27th was distinctly warm on the whole, all parts save Florida having averages above normal, the excesses ranging up to 10° or 15° over much of the interior and Northwest. The highest temperatures of the month were recorded during this period over nearly all parts save along the South Atlantic and Gulf coasts where the warmest days were mainly the 28th to 30th. At some points in Montana the highest temperatures ever reported in March occurred on the 21st.

#### PRECIPITATION

March, like the two preceding months, was distinctly dry, in fact the greater part of the area from the Rocky Mountains eastward had deficient moisture compared with the normal for the month, the chief exceptions being portions of central Alabama, southern Georgia, and northern Florida, where there were locally some important excesses.

Over the far Western States the precipitation was mainly above normal and was usually favorably distributed.

The general absence of rainy days associated with moderate temperatures and lack of important snow cover over most eastern and central districts afforded unusually favorable conditions for the rapid progress of most outdoor occupations.

#### SNOWFALL

There was a rather wide distribution of snowfall, though the amounts were mainly small save in a few localities, mostly over the Northeastern States, where rather heavy falls occurred on the 9th and 10th and again on the 17th and 18th, some sections, particularly from western Maryland northward, having amounts in excess of any that occurred during the preceding winter. Rather heavy falls occurred also in portions of the upper Lake region, particularly in the upper peninsula and northern portions of the lower peninsula of Michigan where highways were badly blocked, a few localities being entirely isolated for more than a week near the end of the month.

Over many of the interior portions the snowfall was the least of record for March, but over much of Kansas and portions of adjacent States there were heavy falls, ranging up to 10 inches or more, on the 15th and 16th, which, melting slowly, soaked the ground thoroughly and were of great benefit to grains and grasses.

Over the western mountains there were mainly about normal falls, the amounts being generally above normal in most northern and far western mountains. The additional snowfall during March together with the plentiful rainfall over the States from California northward added materially to the outlook for a normal water supply during the coming summer.

#### RELATIVE HUMIDITY

The percentages of relative humidity, like the total amounts of precipitation, were mainly below normal over the eastern two-thirds of the country, and above normal, as was the case with precipitation, over the more western districts; though in no cases were the departures from normal of importance save the negative values were unusually large in the upper Missouri and Mississippi Valleys, portions of the Plains States, and lower Lake region.

#### SEVERE LOCAL STORMS, MARCH, 1928

[The table herewith contains such data as have been received concerning severe local storms that occurred during the month. A more complete statement will appear in the annual report of the chief of bureau]

Place	Date	Time	Width of path, yards <sup>1</sup>	Loss of life	Value of property destroyed	Character of storm	Remarks	Authority
Lone Star, Tex. (near).....	3	10 p. m.....	-----	1	-----	Tornado.....	Several farm buildings demolished.....	Official, U. S. Weather Bureau.
New York State.....	4	-----	-----	-----	-----	High winds.....	Roads, buildings, and wire systems damaged throughout the State.	Do.
Tom Green County to Caldwell County, Tex.....	9	-----	-----	-----	-----	Heavy hail.....	Fruit trees, gardens and auto tops damaged; several persons injured. Heaviest damage near Hunter.	Do.
Plant City, Fla.....	12	8 a. m.....	-----	-----	-----	Hail.....	Much injury to small plants and berry crops.....	Do.
Georgia.....	12	-----	-----	-----	-----	Wind, hail, and thunderstorms.	Wires and trees considerably damaged; 1 building unroofed.	Do.
Evansville, Ind., and vicinity.	13	-----	-----	-----	-----	Thunderstorm and hail.	Houses and barns unroofed; signs blown over; windows shattered.	Do.
Meridian, Miss.....	15	p. m.....	-----	-----	-----	Wind and hail.....	Numerous windows and auto tops pierced; sheds and small houses demolished; garden truck ruined.	Do.
Watley, Ala.....	15	11:55 p. m.....	-----	-----	-----	Small tornado.....	Considerable property damage; 1 person injured.....	Do.
Corley, Ala.....	15	-----	-----	-----	\$10,000	do.....	Two houses completely destroyed; other property damaged; 2 persons injured.	Do.
Louisiana (northwest).....	15	-----	-----	-----	-----	Thunderstorms and winds.	Damage chiefly to oil-well equipment and telephone and telegraph lines; timber injured; a number of buildings blown down; livestock killed.	Do.
Vicksburg, Miss.....	15	-----	-----	-----	-----	do.....	Power and communication lines considerably damaged; 1 person injured.	Do.
Sorrento, Fla.....	17	12:10 a. m.....	-----	1	10,000	Tornadoic wind.....	One building demolished; 13 persons injured.....	Do.
Hays and Caldwell Counties, Tex.....	23	P. m.....	2,640	-----	275,000	Hail and wind.....	Heavy crop damage; much destruction in oil fields; path 25 miles long.	Do.
Charles City, Iowa.....	24	-----	-----	-----	-----	Tornadoic wind.....	Windows broken; small buildings damaged.....	Do.

<sup>1</sup> "Mi." signifies miles instead of yards.